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Robert A. Gable
Old Dominion University, rgable@odu.edu

Jo M. Hendrickson

Gary M. Sasso

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Toward a More Functional Analysis of Aggression

Robert A. Gable
Old Dominion University

Jo M. Hendrickson and Gary M. Sasso
University of Iowa

Abstract

Given the substantial and oftentimes irreversible human loss resulting from aggressive acts, the need for systematic, treatment-linked assessment of aggression in school-aged children and youth cannot be overstated. Based upon recent research, the authors provide a broadly framed model for the functional analysis of aggression in school-age children and youth. Our model incorporates multi-modal data collection and data triangulation to generate credible hypotheses regarding the function(s) of aggression. Three primary data sources--record review and interviews, naturalistic observation, and analogue assessment--form the cornerstone of the model. Key features of our approach to the assessment of aggression include operational definition(s) of target behavior(s), examination of the environmental context(s) of aggression, and discovery of the function(s) of aggressive behaviors for the individual. Samples of several specific, ready-to-use data collection instruments and a basic description of the assessment procedure are presented. The assessment process assumes that a team of individuals participates in data collection, data analysis, and hypothesis generation.

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Countless acts of aggression and violent behaviors, one incidence after another, typify America's classrooms; the worst aggressive acts are documented and students counseled, suspended, or expelled from school on a daily basis. With each additional seemingly senseless and uncontrollable act, parents and professionals further despair. Yet, research indicates that for many youngsters "aggression" is not unpredictable or without "sense." We know, for example, that as the majority of young children grow, their aggressive behaviors are replaced increasingly by culturally-sanctioned, prosocial behaviors (Kauffman, 1993). In contrast, data clearly show that for some children--particularly those whose episodes of aggression begin early, are frequent, and receive reinforcement--aggressive behavior amplifies, becomes threatening and assaultive, entrenched, and highly resistant to change (Patterson, 1982, 1992). Research also documents the operant nature of disruptive and

Please direct inquires for protocols to Jo M. Hendrickson, N259 Lindquist Center, Division of Curriculum and Instruction, The University of Iowa, Iowa City, IA 52242

Address: Robert A. Gable; Child Study Center; Old Dominion University; Norfolk, VA 23508.

Pages 226-242

aggressive behavior (Taylor & Carr, 1992). We can be fairly certain that for many children and youth, their aggressive behaviors are context specific and serve identifiable functions.

In this article a broad model for a functional assessment of aggressive behavior in children and youth is presented. We believe this model for assessing aggression will help multidisciplinary teams "make sense" of the aggressive acts of children. Data gathered are used to establish a framework for designing effective, contextually-appropriate interventions for individual students. In this paper, we restrict discussion to acts of aggression that occur mainly in schools--acts that are meant to physically harm someone (Landy & Peters, 1992) and are committed by children and adolescents for whom we share some responsibility.

First, a brief discussion of conceptual issues underlying our approach to aggression is provided. Next, we introduce our functional assessment model, the concept of data triangulation, and describe three key aspects of the data collection process--record review and interviews, naturalistic observation, and analogue assessment. An example of an instrument or process that corresponds with each of these three dimensions is provided.

Conceptual Basis of a Broader Functional Analysis of Aggression

The 1970s witnessed a surge of interest in combining certain aspects of ecological psychology and behavior analysis (Rogers-Warren, 1984). Ecological psychologists traditionally examine naturally occurring environmental relationships and determine their influence on behavior primarily by carefully assessing "behavior settings," that is, various properties of the environment, and drawing conclusions about the causally-related properties of those ecosystems. Within an ecological perspective, aggressive acts are viewed as the outcome of the interface between environmental variables (e.g., physical objects, events, people) and the student. The aim of an ecological assessment within a school would be to uncover specific discordant behavior-environment relationships (Hendrickson, Gable, & Shores, 1987). The emphasis ecological psychology places on the natural environment is appealing in that assessment data are likely to have real-world utility.

Behavior analysts also stress the importance of environmental variables. They manipulate the environment systematically to conduct a "functional analysis" of behavior, that is, to identify important, controllable, and ideographic relationships for a target behavior or class of behaviors (Sulzer-Azaroff & Mayer, 1991). The term "important" refers to variables that account for a large percentage of the variance of behavior, "controllable" refers to variables that can be manipulated by someone, and "ideographic" refers to functional relationships identified on an individual-by-individual basis (Gresham, 1991).

The usefulness of ecological and functional analyses is based on what is known as conditional probability--our ability to predict one event from knowledge of another event or variable (Gunter et al., 1993; Shores et al.,

1993). Thus, a functional assessment of aggression is based on knowledge that: (a) aggressive behavior is a part of its environmental context, (b) aggressive behavior is a product of specific environmental factors, and (c) aggressive behavior may consist of functionally interdependent acts that covary in relationship to other behaviors and environmental events. Accordingly, we can conceptualize aggression as being a multifaceted class of largely situation-specific behaviors under the stimulus control of one or more variables.

Functional Assessment of Aggression in the Classroom

Figure 1 presents our model for the functional assessment of aggressive behavior of children and youth. Given there is some evidence of a student 's aggression, the next step is for the multidisciplinary or assessment team to collect data (across time and settings) to determine the topographies, frequency, and severity of the aggressive behavior. In this process, precise operational definition(s) of the target aggressive behavior(s) is (are) developed, and the assessment team verifies that intervention indeed is warranted. Following the resolution of any medical or other biophysical issues, a three-pronged functional assessment is conducted and hypotheses generated regarding the determinants of the aggression. Generally speaking, a hypothesis will emerge that leads to the conclusion that a student's aggression is due primarily to either a *knowledge/skill deficit* or a *performance deficit*. With multiple data sources to support the hypothesis (based on the triangulation of data), an intervention plan is designed. The primary aim of intervention is never to simply eliminate aggression; rather, the goal will focus on building the student's behavioral repertoire/knowledge or teaching the student when and how to engage in appropriate replacement behaviors. The intervention plan, in turn, will be evaluated for its effect on aggression and the assessment-treatment cycle continued.

Data Triangulation

Data from three key data collection processes--record review and interviews, naturalistic classroom/school observations, and analogue assessment--are gathered. Unlike traditional record reviews, interviews, and observations in naturalistic and systematically manipulated conditions, the questions we address are designed to specifically glean information on the function of aggression and the precise conditions most likely to evoke it. Together the data are triangulated, that is, recorded on a common chart for simultaneous examination and comparison. By using various types of data, especially interviews and naturalistic observations, the validity and generalizability of the analogue data become less speculative, and the probability of identifying the most powerful behavior determinants is greatly enhanced. The answers to such issues as whether the problem behavior is systemic or ideographic; chronic, episodic or acute; stimulus bound or a free operant;

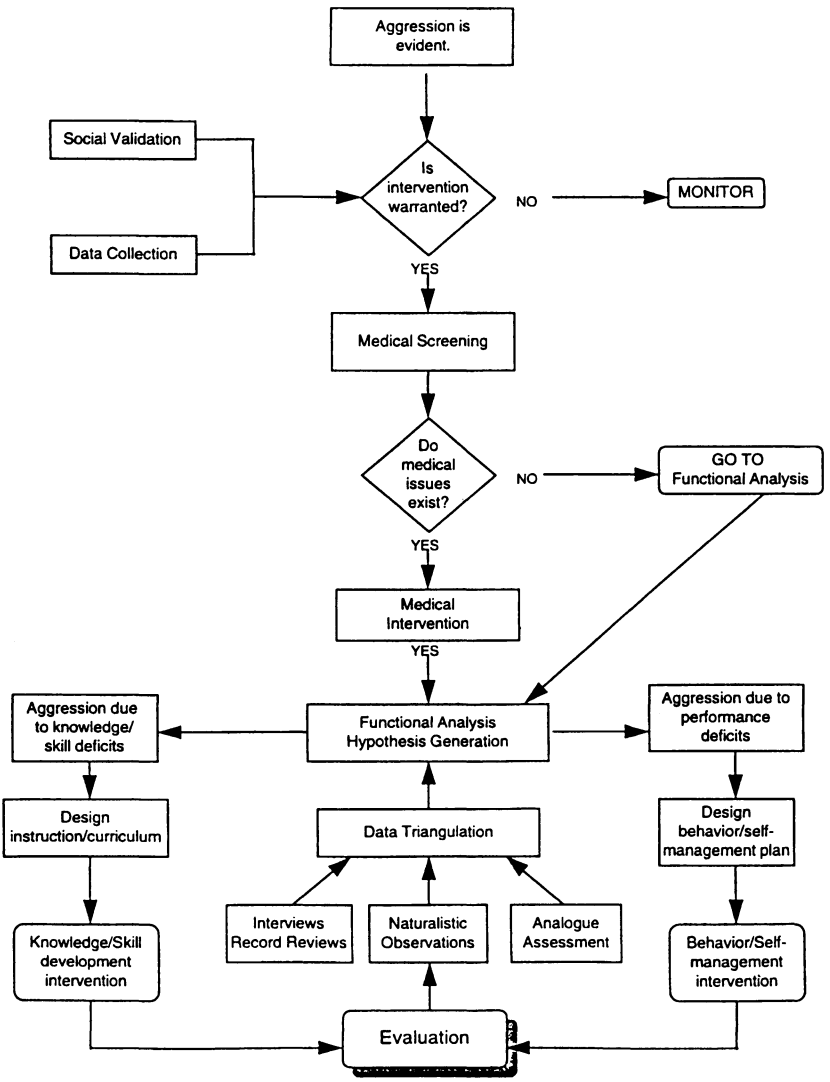
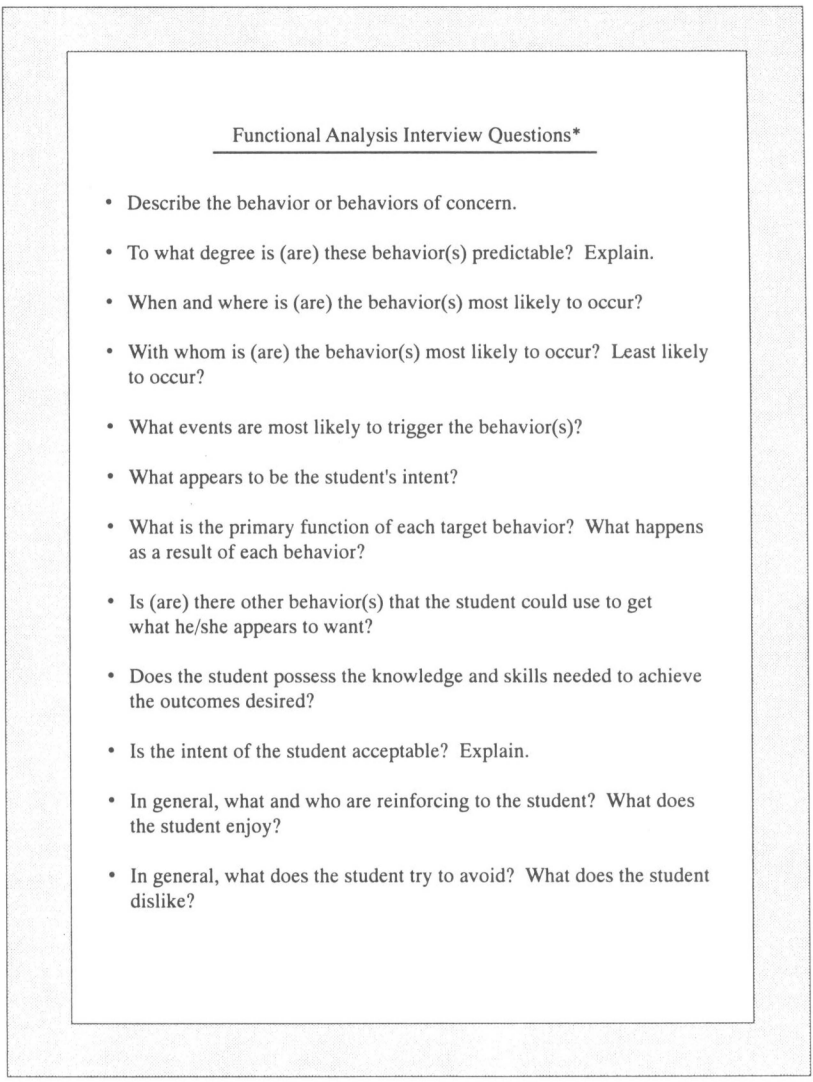


Figure 1. Model for functional assessment of aggression.



Functional Analysis Interview Questions*

- Describe the behavior or behaviors of concern.
- To what degree is (are) these behavior(s) predictable? Explain.
- When and where is (are) the behavior(s) most likely to occur?
- With whom is (are) the behavior(s) most likely to occur? Least likely to occur?
- What events are most likely to trigger the behavior(s)?
- What appears to be the student's intent?
- What is the primary function of each target behavior? What happens as a result of each behavior?
- Is (are) there other behavior(s) that the student could use to get what he/she appears to want?
- Does the student possess the knowledge and skills needed to achieve the outcomes desired?
- Is the intent of the student acceptable? Explain.
- In general, what and who are reinforcing to the student? What does the student enjoy?
- In general, what does the student try to avoid? What does the student dislike?

*Adapted from Lawry, Storey, and Danko (1993)

Figure 2. Interview assessment questions.

one of execution or motivation; and, one of behavior excess or deficit emerge as the assessment team analyzes the data.

Record Review and Interviews

Careful review of student records can be time-consuming, yet is very important. Documentation of aggression at a young age, for instance, often indicates high risk factors and confirms the need for intervention. School records also contain a host of data pertinent to identifying the function of aggression for a given child (e.g., teacher logs, discipline reports, and principal's notes). Formal test data, likewise, may prove to be clinically significant. Standardized tests may reveal co-morbidity factors associated with aggression (e.g., impoverished social skills, language and communication deficits, cognitive deficits, and/or distorted social perception). Such data would be especially useful in confirming a skill/knowledge deficit as the basis for aggression.

Figure 2 contains a list of questions the assessment team can ask when interviewing teachers, parents, and even the student herself/himself. As can be seen, these questions are directed to identifying the determinants and functions of aggression.

Naturalistic Observation

Observations in the classroom, on the playground, and throughout the school can substantiate the conditions in which aggression is unlikely to occur and those that evoke prosocial behaviors. Numerous observation systems are common to schools; however, most do not assist the assessment team in identifying the specific micro-level environmental conditions in which the student is most likely to aggress.

Figure 3 presents an ecobehavior observation matrix that can reveal the exact classroom conditions during which a student aggresses, the type of aggression or disruptive behavior exhibited, and the consequences of those aggressive acts. An advantage of this system is that the precise conditions under which the student responds appropriately, as well as the type of acceptable response, are recorded; thus, a student's potential areas of strength and interest are revealed. The observation system also is designed with disruptive and aggressive behaviors ordered in an hierarchical manner; this aids readability and data interpretation. The observation protocol is based on the work of Greenwood and his colleagues (Greenwood & Carta, 1987) and Hendrickson (1991). The illustration in Figure 3 is designed for an elementary or middle school classroom.

The assessment team must modify the ecobehavioral observation form to reflect environmental variables and behavioral expectations indigenous to different settings (e.g., a preschool, a high school lunch room) in the target student's day. Typically, one form is used for each 10- to 30-minute observation session and a momentary time sampling procedure is employed. A single tally mark (/) is placed in the appropriate cell every 10, 15, or 20 seconds to indicate the behavior that

ECO-BEHAVIOR OBSERVATION MATRIX

O_1 _____
O_2 _____
Rel _____

Student: _____ Day: M T W R F Date: _____ Teacher(s): _____ Pre: ___ Progress: ___ Post: ___

Instructional Activity: _____ N of Students: _____ Start Time: _____ End Time: _____ TOT: _____

Obs. Interval: 10 sec 15 sec 20 sec ***Time Sampling Procedure:*** 1. Continuous Recording: _____ 2. Alternating Min. Obs./Not Obs: _____ 3. Other: _____ Phase: _____

Materials Tasks	Appropriate Academic Responses									Inappropriate Behaviors												
	Academic Talk	Answer Questions	Ask Questions	Attention/ Participation	Read	Write	Keyboarding	Other	Total	Aggressive-Personal	Aggressive-Property	Disruptive	Not Comply Refusal	Bites, Fidgets, Tenses	Out of Seat	Talk Out	Off-Task: Inappropriate Engagement	Off-Task: Staring, Sullen	Other	Total Inappropriate	Grand Total	Consequences of Inappropriate Behaviors
Listen-Lecture																						
Teacher-Pupil Discussion																						
Magazines Texts																						
Paper-Pencil Worksheets																						
Manipulatives Equipment																						
Instructional Games																						
Computer/ Other Media Technology																						
Student-to-Student																						
Cooperative Group																						
Transition (w/i class)																						
Transition (bet. classes)																						

Comments

Figure 3. Naturalistic-ecobehavioral observation form.

was occurring at that moment and the concomitant instructional activity/task. To the far right, the observer notes the consequences of observed acts of aggression. When completed, the matrix forms a visual depiction of the student's behavioral patterns, the typical classroom activities (see categories listed on the far left), and behavioral expectations for that setting at that time (see categories across the top left columns). Greater precision is achieved by converting the tally marks to frequencies and percentages and totaling the subcategories of tasks and behaviors. (For a more detailed description of how to use this observation system see Hendrickson, 1991.)

Analogue Assessment

Experimental Analysis of Aggression

The purpose of this section is to describe an outclinic assessment model for aggressive behavior based on functional analysis procedures. The goal, of course, is to use the information on the observed function(s) of aggression for prescribing treatments.

The major variable affecting the successful use of functional analysis procedures in an outclinic setting is time (Sasso & Reimers, 1988). Because outpatient evaluations are time-limited (e.g., 90 minutes), assessment frequently is descriptive and generally involves indirect methods such as interviews and behavioral checklists. Brief descriptive assessments such as an ABC analysis (Bijou, Petersen, & Ault, 1968) and other observations in unstructured environments (Reimers, Wacker, Cooper, Sasso, Berg, & Steege, 1993) also may be conducted. However, descriptive assessments frequently do not provide the precise information needed to design effective and efficient interventions for aggressive behavior (Wacker et al., 1990). Unfortunately, the use of brief structured behavioral assessment methodology is likewise problematic. Operant procedures rely on repeated measures over time to produce reliable and valid data. Consequently, adaptation of functional analysis methodology to a 90-minute time frame requires modifications that continue to allow a determination of the function(s) of aggressive behavior with some degree of confidence.

The Clinical Assessment Process

Clinical programs that employ functional analysis methodology to determine the operant variable(s) controlling aggressive and other aberrant behavior generally follow a standardized assessment process. For example, most assessment sequence(s) first involve obtaining an historical account of the persons and target behavior through questionnaires and checklists. This information is used to develop tentative hypotheses regarding the functional variable(s) maintaining the behavior. An interview of the parents/caretakers confirms or modifies the initial hypothesis and a brief functional analysis follows.

Functional analysis is based specifically on the work of Iwata and his colleagues (1982, 1990) and Carr and Durand (1985) and consists of an analogue assessment of the conditions that may maintain the aggressive behavior. There are five functional analysis analogue conditions typically carried out.

Attention (Gain). In this condition, the examiner and client enter the therapy area together. The client/child is provided with a wide array of preferred toys and is told to play alone while the examiner does some work. The examiner, seated several feet away, pretends to read or write. The examiner attends consistently to each occurrence of the target behavior (e.g., throwing objects) by providing some type of disapproval statement (e.g., "Don't throw your toys, you'll break them."). All other behaviors are ignored by the examiner. This condition is designed to assess *social attention* as a variable maintaining aggression.

Tangible (Gain). A variation of the Attention (Gain) condition is used to assess behavior maintained by tangible reinforcement. In the Tangible condition (Durand & Crimmins, 1988), the client/child usually engages in a specific task. Preferred toys, edibles, or desired activities are within view and each occurrence of the target behavior (e.g., throwing, hitting) results in these preferred items being made available to him or her. In this condition, when aggressive behavior occurs at a high rate, it is likely that the behavior is controlled by *tangible reinforcers.*

Demand (Escape). In this condition, the examiner and client/child are positioned at a table. Tasks are selected that the client/child is capable of completing but finds difficult to perform. A three-prompt, guided compliance procedure (Horner & Keilitz, 1975) is employed with the presentation of each task. The examiner presents the task with a verbal prompt (e.g., "Put the block in the bucket.") and allows the client 5 seconds to comply. If the client/child fails to respond, the examiner then repeats the verbal prompt and models successful completion of the task (e.g., "Put the block in the bucket like this [models]--you do it."). If the client/child fails to respond, the examiner again repeats the verbal prompt and physically guides the client/child through the request. If the client/child engages at any time in the target aggressive behavior, the task is removed and the examiner walks away. Following termination of the aggressive behavior, the therapist reintroduces the task. This condition assesses the role of *negative reinforcement* or *escape* in the maintenance of aggressive responses.

Alone. In this condition, the client is placed in a room with no sources of potential reinforcement. Typically, the therapist is not present. The rationale for this condition is that some behaviors are maintained by sensory reinforcement (i.e., sensory induction). If the frequency of the target behavior is high in this condition, sensory reinforcement is inferred. However, this condition is not generally useful to the assessment of aggressive responses, because these behaviors rely on the presence of others and/or materials. Thus, sensory motivated aggression toward others is not possible and destructive behavior (i.e., aggression against property) requires the presence of materials/objects. A modification of the Alone condition is known as the Ignore condition.

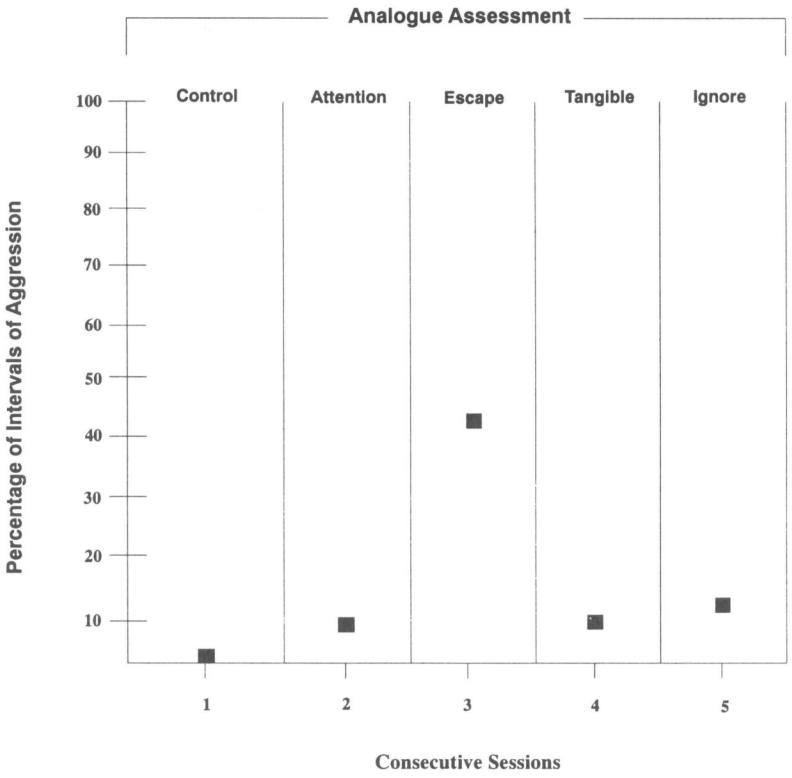


Figure 4. Standard clinical functional analysis of aggression for Susan across Toy Play, Attention, Demand, Tangible, and Ignore Conditions.

In the Ignore condition the therapist is present but does not respond to the client under any circumstances.

Toy Play (Control). During the Attention (Gain) condition, the examiner and client/child are together, and the child has access to a number of preferred toys. The child is allowed to play alone or cooperatively and is occasionally prompted to engage in play activities. Rather than providing social disapproval, the examiner ignores the child each time an aggressive behavior is exhibited. Additionally, during this condition, the examiner provides frequent (approximately every 30 seconds) social praise for behaving appropriately. No educational tasks or demands are presented. This condition is designed to act as a *control* condition for other phases of assessment.

Each assessment condition generally is conducted for 10 minutes. Staff determine the order of presentation. An initial clinical analogue sequence might consist of: Toy Play--Attention--Demand--Tangible--Ignore. Visual inspection of the data obtained during each condition

provides the basis for treatment recommendations related to aggressive behavior. For example, Figure 4 shows the results of a functional analysis conducted for Susan, a 9-year-old client with frequent, intense aggressive behavior. The data clearly show that Susan's aggressive behaviors are controlled by negative reinforcement; that is, aggression provides an escape from undesirable activities or persons.

Replication designs. Although the standard protocol described can be effective in identifying a primary function of aggressive behavior, it is likely that the single data points generated across the 10-minute conditions may be misleading. For instance, there is no control for possible order effects or no means of assessing variability within conditions. Brief replication phases (see Figure 5) can help overcome these limitations. In the replication phase, 5-minute sessions using the conditions that resulted in the lowest and highest levels of target aggressive behavior are introduced. The goal is to identify a consistent pattern within the two conditions. For example, if the initial assessment revealed frequent aggressive behavior in the Escape condition and no aggressive behavior in the Tangible condition, a brief repetition of those two conditions would serve to reveal whether or not these effects would replicate. If replication is achieved, and if the difference in the target behavior across the two replication conditions is pronounced, the analogue assessment data are more believable and greater confidence can be placed on the resulting treatment approach.

There are other modifications that can be made to the initial functional analysis protocol to enhance the effectiveness of interventions. One modification involves use of a contingency driven assessment protocol based on the initial assessment. For example, Figure 6 shows an initial functional analysis that suggests social attention is the variable maintaining aggressive behavior. During this assessment, two classes of behavior were observed--aggression and an alternative communication behavior. Following the initial functional analysis, contingency reversal conditions were conducted, beginning with the condition that had produced the highest level of aggressive behavior. This time, however, attention was presented only for the occurrence of a specific communicative act (i.e., the manual sign "Please."), and instances of aggression were ignored. The communicative response was established by modeling and physically prompting it every 30 seconds. Following this modified contingency reversal condition, a standard Attention condition was conducted with a return to the contingency reversal condition. The goal is to identify the function of aggression and to assess the potential of a given treatment by reversing the contingencies shown to maintain the response. If, as shown in Figure 3, there are relatively substantial differences in aggressive behavior and the replacement behavior across conditions, our confidence in the treatment recommendation is enhanced.

Multiple functions. One final issue in the functional analysis of aggression using analogue/assessment pertains to multiple functions of behavior and multiple aberrant behaviors (Derby et al., 1994). To illustrate the problems associated with several topographies and

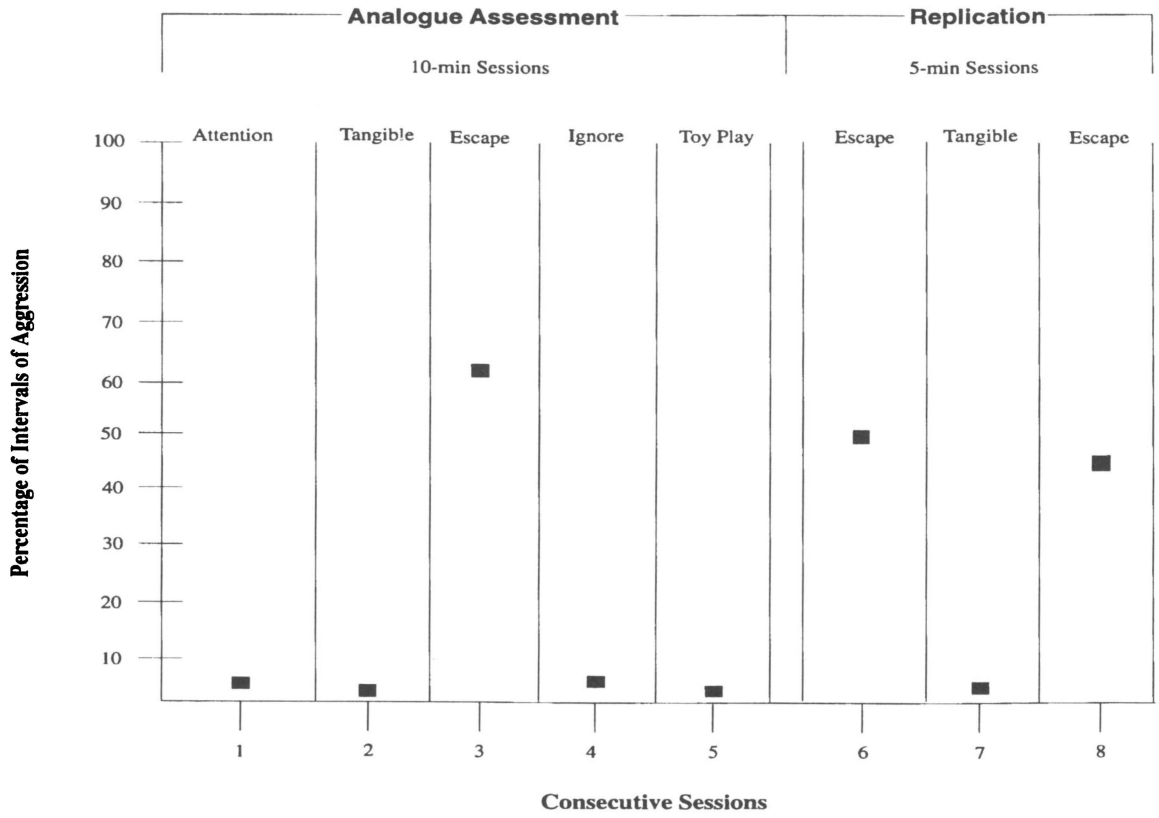


Figure 5. Clinical functional analysis with replication phases.

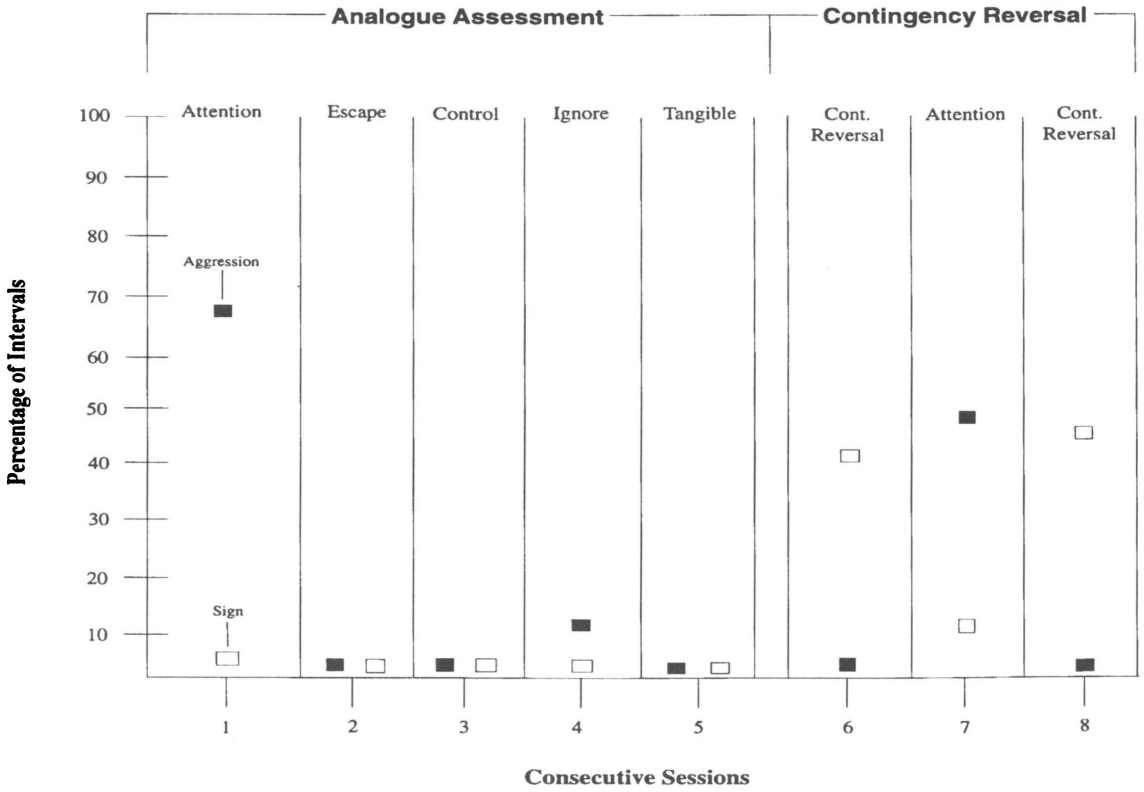


Figure 6. Clinical functional analysis of aggressive behavior with contingency reversal.

functions of self-aggression and aberrant behavior, consider the following:

> A functional analysis with replication successfully identified an escape function of Bill's self-injurious behavior (i.e., head slapping). Moderate levels of hand waving and mouthing behavior also were observed during the Alone condition. A treatment was devised for self injurious head slapping (i.e., he was never allowed to escape from tasks following instances of self injury). Bill also was taught to manually sign, "Please" to escape tasks. Three months later, Bill returned for a follow-up visit. Parental report and observation revealed infrequent head slapping and consistent use of "Please" by Bill. Unfortunately, hand-waving and mouthing now occurred at greatly increased levels and were of concern to the parents and examiners.

What had happened? Evidently the treatment for self-injury inadvertently reinforced Bill's stereotypic behaviors (i.e., hand-waving and mouthing). Specifically, Bill was allowed to escape from demanding, non-preferred situations into what was essentially an Alone condition (i.e., a condition in which few or no demands were made). Thus, the conditions responsible for maintaining stereotypic behavior were in place for a large part of Bill's day, and the level of these behaviors increased markedly in correspondence. Bill's case and others indicate that a number of behaviors and their functions must be assessed and considered when identifying options for the treatment of a given behavior in that the treatment itself may inadvertently, but directly, support the emission of other aggressive and aberrant responses.

To assess the multiple functions of behaviors, a protocol that addresses each behavior and each possible function is needed. In many cases aggressive and aberrant behaviors belong to the same response class; that is, are all maintained by the same reinforcer(s) and should respond to the same treatment. On the other hand, in many cases there are multiple target behaviors and these behaviors have multiple functions. When an assessment team hypothesizes that multiple functions are served by several topographically different behaviors, each behavior should be observed independently (see Figure 7). In this example, the data show hitting and screaming are maintained by negative reinforcement (Escape), while self-injurious hair pulling is maintained by sensory reinforcement (Alone). By assessing the function of each response, it is possible to determine that aggression to others--hitting and screaming--serves an escape function while self-injury, in part, appears to be maintained by sensory reinforcement. Treatment recommendations are then prepared for each class of behavior.

Clinical/Analogue analyses of aggression and aberrant behavior have allowed functional analysis technology to progress. The control afforded by the clinical setting allows the empirical determination of functional relationships between behavior and controlling variables and enables the assessment team to triangulate data from multiple sources, thus

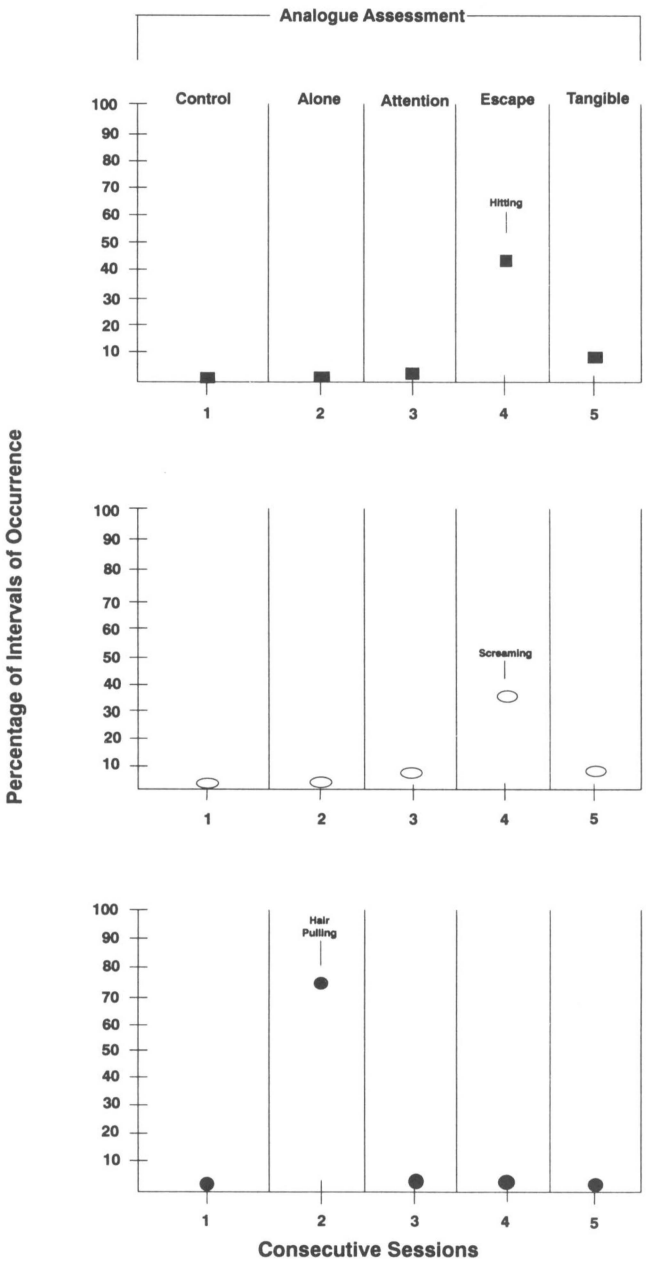


Figure 7. Multiple topography analysis across aggressive and stereotypic behaviors.

enhancing the social validity, reliability, and ecological soundness of treatment approaches.

Summary

A model for the functional assessment of aggression has been described and examples of classroom and clinical observation tools and procedures discussed. The essence of this model is to gather information from various sources that has direct relevance for generating hypotheses regarding the function of aggression for a given student. Our functional assessment of aggression model is predicated on research and clinical practice that documents the situation-specific and functional nature of aggressive behaviors in children and youth. The model provides a positive, optimistic approach for educators to use to assess aggression and prescribe interventions that further develops student competencies. Educators, parents, and others are encouraged to remember that the vast majority of newsworthy acts of violence are preceded by lesser acts of aggression, behaviors well within the capacity of educators to eradicate, especially if these children and youth are taught the skills and provided opportunities for socially appropriate, productive behavior to function as effectively as their aggressive behavior.

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